Doc# NSCS-M-P-7093-02-45
Title: Oil Separation Process Overview
Issue Dt: 06/26/2018
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Cat: Quality Doc Type: SOP
Auth:
Desc: Oil Separation Process Overview
Loc: Midwest - Utilities-Midwest - Plant Maintenance-Midwest-Gary Works

STEPS	PROCEDURES
Purpose	To provide an overview of the pretreatment system used for the removal and processing of oils and greases entrained in wastewaters discharged from the following mill operations: • 52” Five Stand • 80” Five Stand • DCR Mill • Tin Mill Temper Mill • Transportation Garage • Oily Waste Pad The discharge from the pretreatment system is further processed at the Final Treatment Plant.
Overview	
Equipment	The pretreatment system process equipment is a flow equalization tank, 2 North API oil interceptors, a South Monroe interceptor, 2 dissolved air flotation tanks (DAF’s), two oil Holding Tanks, a centrifuge, an Oil Storage Tank and miscellaneous pumps and support equipment.
Equalization	Wastewater containing animal fat, vegetable and mineral oils is pumped to the equalization tank. After equalization, the wastewater flows by pipeline to the North interceptor mix tank to be discharged in the North API interceptors. Discharge of the North Interceptor is routed to either Final Treatment equalization basins or the South Interceptor Mix Tank.
Chemical Addition	Tannin and polymer may be added to the interceptors to aid in the oil separation by breaking the emulsified oils and forming flocculated solids. The tannin and polymer are pumped into the system from storage tanks and associated pump skids.
Oil Separation	In both the North and South oil interceptors the oils float to the surface of the wastewater and are mechanically skimmed off into skimmer sumps for transfer to the oil holding tanks.

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Dissolved Air Flotation

At the South interceptor system, further separation and removal is performed by dissolved air flotation (DAF). The skimmed wastewater gravity feeds into two DAF tanks where fine bubbles are used to float remaining oils to the surface. This oil is skimmed into a sump where it is returned to the equalization tank.

Discharge

The wastewater that has been treated to remove oils is then discharged from the North API interceptors and/or DAF's and flow by gravity to the equalization basins at the Final Treatment Plant for further treatment.

Oil Concentration

Skimmed oily wastewater is pumped to the oil Holding Tanks. Steam heat is used in these tanks to facilitate the separation of the oil from any remaining water. After separation, the water is decanted and discharged to the North API Interceptors.

Centrifugation (performed by third-party)

After decanting the water in the holding tanks the oil is ready for final processing. The concentrated oil is pumped to a centrifuge where a third-party contractor removes any remaining water and stores [redacted] pure oil to be recycled as off specification fuel oil.